

AMENDMENTS TO THE CLAIMS

1. **(CURRENTLY AMENDED)** A vacuum chamber ~~(100)~~ comprising:
 - a. chamber walls ~~(104)~~ surrounding a chamber interior;
 - b. a port ~~(108)~~ defined in the chamber walls ~~(104)~~, the port ~~(108)~~ opening between the chamber interior and a chamber exterior;
 - c. a rigid viewing tube ~~(200)~~:
 - i. extending from the port ~~(108)~~ into the chamber interior, and
 - ii. being closed by a window ~~(206)~~ situated within the chamber interior at a fixed distance from the port ~~(108)~~, the window ~~(206)~~ being at least partially transparent,whereby the viewing tube ~~(200)~~ forms a passage extending from the exterior of the vacuum chamber ~~(100)~~ toward the chamber interior and terminating in the window ~~(206)~~, the passage being substantially unobstructed between the port ~~(108)~~ and window ~~(206)~~ whereby an imaging device ~~(104)~~ may be inserted into the passage and moved axially along the passage and also laterally therein with respect to the window ~~(206)~~.
2. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 further comprising:
 - a. a track ~~(312)~~ fixed with respect to the port ~~(108)~~;
 - b. a positioner carriage ~~(308)~~ movable along the track ~~(312)~~;
 - c. a positioner subcarriage movably affixed to the positioner carriage ~~(308)~~; and
 - d. an imaging device ~~(104)~~ on the positioner subcarriage, the imaging device ~~(104)~~ being at least partially situated within the viewing tube ~~(200)~~ and the chamber interior.
3. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 2 wherein the track ~~(312)~~ is arcuate, with a center of curvature situated within the chamber interior.

4. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 further comprising:
 - a. an imaging device ~~(104)~~; and
 - b. an imaging device positioner ~~(300)~~ movably mounting the imaging device ~~(104)~~ at least partially within the viewing tube ~~(200)~~ and the chamber interior, wherein the imaging device ~~(104)~~ is movable axially into the passage of the viewing tube ~~(200)~~ and also laterally therein.
5. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 4 wherein the imaging device positioner ~~(300)~~ includes:
 - a. an arcuate track ~~(312)~~ fixed with respect to the port ~~(108)~~;
 - b. a positioner carriage ~~(308)~~ movable along the track ~~(312)~~; and
 - c. a positioner subcarriage ~~(310)~~ whereupon the imaging device ~~(104)~~ is situated, the positioner subcarriage ~~(310)~~ being movably affixed to the positioner carriage ~~(308)~~.
6. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 wherein the arcuate track ~~(312)~~ has a center of curvature situated within the chamber interior.
7. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 wherein the positioner carriage ~~(308)~~ includes wheels ~~(326)~~ engaging opposing sides of the track ~~(312)~~.
8. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 7 wherein the positioner carriage ~~(308)~~ further includes a pinion ~~(330)~~ engaging the track ~~(312)~~.
9. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 wherein one or more springs ~~(348)~~ are interposed between the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~, and wherein the springs ~~(348)~~ bias the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~ apart.

10. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 9 further comprising one or more threaded members ~~(344)~~ extending between the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~, wherein rotation of the threaded members ~~(344)~~ repositions the positioner subcarriage ~~(310)~~ with respect to the positioner carriage ~~(308)~~.
11. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 wherein:
- a. the positioner carriage ~~(308)~~ moves along the track ~~(312)~~ in a carriage plane;
 - b. the positioner subcarriage ~~(310)~~ is movable with respect to the positioner carriage ~~(308)~~:
 - i. in a first plane oriented at least substantially perpendicular to the carriage plane; and
 - ii. in a second plane oriented at least substantially parallel to the carriage plane.
12. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 wherein:
- a. the positioner carriage ~~(308)~~ moves along the track ~~(312)~~ in a carriage plane, and
 - b. a first threaded member ~~(344)~~ extends between the positioner subcarriage ~~(310)~~ and the positioner carriage ~~(308)~~, and rotation of the first threaded member ~~(344)~~ moves the positioner subcarriage ~~(310)~~ relative to the positioner carriage ~~(308)~~ in a direction at least substantially perpendicular to the carriage plane.
13. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 12 further comprising a second threaded member ~~(338)~~ extending between the positioner subcarriage ~~(310)~~ and the positioner carriage ~~(308)~~, wherein rotation of the second threaded member ~~(338)~~ moves the positioner subcarriage ~~(310)~~ relative to the positioner carriage ~~(308)~~ in a direction at least substantially parallel to the carriage plane.

14. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 5 further comprising:
- a. one or more springs ~~(348)~~ interposed between the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~, wherein the springs ~~(348)~~ bias the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~ apart; and
 - b. one or more threaded members ~~(338, 344)~~ extending between the positioner carriage ~~(308)~~ and positioner subcarriage ~~(310)~~, wherein rotation of the threaded members ~~(338, 344)~~ repositions the positioner subcarriage ~~(310)~~ with respect to the positioner carriage ~~(308)~~.
15. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 wherein the viewing tube ~~(200)~~ includes a flange ~~(204)~~ removably affixed to the port ~~(108)~~ with the viewing tube ~~(200)~~ extending from the flange ~~(204)~~ into the chamber interior, whereby the viewing tube ~~(200)~~ may be removed from the port ~~(108)~~ by removing the flange ~~(204)~~ from the port ~~(108)~~.
16. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 wherein the viewing tube ~~(200)~~ includes:
- a. an interior end situated within the chamber interior, wherein the window ~~(206)~~ is situated at or immediately adjacent to the interior end; and
 - b. an exterior end opposite the interior end and situated outside the chamber interior, the exterior end bearing an outwardly-extending flange ~~(204)~~ removably affixed to the port ~~(108)~~, whereby the viewing tube ~~(200)~~ may be removed from the port ~~(108)~~.
17. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 wherein the entirety of the viewing tube ~~(200)~~ extends into the chamber interior between:
- a. a circumferential flange ~~(204)~~ affixed to the port ~~(108)~~, and
 - b. the window ~~(206)~~.

18. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 wherein the viewing tube ~~(200)~~ decreases in diameter between the port ~~(108)~~ and the window ~~(206)~~.
19. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 1 further comprising a microscope situated within the chamber interior and spaced from the viewing tube ~~(200)~~.
20. **(CURRENTLY AMENDED)** The vacuum chamber ~~(100)~~ of claim 19 wherein the microscope is an atom probe microscope.
21. **(NEW)** A vacuum chamber comprising:
- a. chamber walls surrounding a chamber interior;
 - b. a port defined in the chamber walls, the port opening between the chamber interior and a chamber exterior;
 - c. a viewing tube:
 - i. having viewing tube walls rigidly extending from the port into the chamber interior, thereby defining an open passage extending from the exterior of the vacuum chamber toward the chamber interior, and
 - ii. the viewing tube walls terminating in an at least partially transparent window situated within the chamber interior at a fixed distance from the port; and
 - d. an atom probe microscope spaced from the viewing tube within the chamber interior.
22. **(NEW)** The vacuum chamber of claim 21 further comprising an imaging device movably situated within the passage between the viewing tube walls.

23. **(NEW)** A vacuum chamber comprising:
- a. chamber walls surrounding a chamber interior, the chamber walls having a port defined therein which opens between the chamber interior and a chamber exterior;
 - b. a viewing tube having a length extending between a terminal flange and an opposing terminal window, the flange being mounted on the chamber walls about the port with:
 - (1) the length of the viewing tube extending into the chamber interior, and
 - (2) the window being fixed within the chamber interior spaced from the port, with the length of the viewing tube defining an open passage from the chamber exterior into the chamber interior to terminate at the window; and
 - c. an atom probe microscope spaced from the viewing tube within the chamber interior.
24. **(NEW)** The vacuum chamber of claim 23 further comprising an imaging device situated within the passage between the viewing tube walls.
25. **(NEW)** The vacuum chamber of claim 24 wherein the imaging device is movable within the passage with respect to a central axis defined along the length of the passage.